PHYS 522 Quantum Mechanics (II)

Syllabus

Objectives: Applications of the fundamentals of quantum mechanics --- Approximate methods (perturbation and variation), fine structure of hydrogen atom, Dirac Equation, identical particles, scattering theory.

Course Credit: 3 semester hours
Meeting Times: Tuesday and Thursday, 10:50am-12:05pm
Classroom: TBA

Format: A lecture course with weekly problem sets, a midterm exam and a final exam.

Textbook: Modern Quantum Mechanics (2nd Ed.), J.J. Sakurai, Addison-Wesley, 2011.

Course web page: http://www.owlnet.rice.edu/~hpu/courses/PHYS522.html

Course Instructor

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Homework and Grades

I plan to assign a homework set each week, usually due at the beginning of class one week later. Homework sets will be distributed in class but they will also be available from the course web page.

Homework Policy: You are encouraged to discuss the homework problems with your PHYS 522 classmates and with the instructor, but you must write up your solutions *independently*. Of course, you must not copy from anyone else's solutions.

Late Policy: The grade for late homework will be multiplied by a decaying exponential with a time constant of five days. Late homework must be delivered to the grader or the instructor for that problem set and the student must write "Late" and the date and time on the front page.

Grading Weights:	Homework:	30%
	Midterm Exam:	30%
	Final Exam:	40%

Course Content

I plan to cover Chapters 5 to 8 of the textbook.

1. Approximation Methods: time-independent perturbation, variational method, hydrogen-like atoms (fine and hyperfine structures, effects of external fields)
2. Brief introduction of relativistic spin-1/2 particles: Dirac Equation
3. Time-depedent perturbation, atom-photon interaction
4. Scattering theory

Any student with a disability requiring accomodations in this class is encouraged to contact the instructor after class. Additionally, students should contact the Disabled Student Services office in the Ley Student Center.

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